

California Earthquake Prediction Evaluation Council

November 4, 2009

California Earthquake Prediction Evaluation Council

- 9 Scientists from government, universities or private sector
- Appointed by the CalEMA Director for 5 year term
- Chaired by the State Geologist
- State Law Provides immunities
- Meets as necessary

- Advise CalEMA and the Governor on credibility of predictions and policy options

What CalEMA Does

- Convenes CEPEC
- Disseminates findings and notifications to counties and media
- Developed California Short-Term Earthquake Prediction Response Plan
- Developed California Earthquake Advisory Response Plan
- Plans date to 1990-need revision

CEPEC Rapid Assessment Plan

- Post Earthquake (M>5) Conference Call
- Assessment of Probabilities 'Follow-on' Quake
- CalEMA may Issue an Earthquake Advisories based on Recommendations of CEPEC
- Not every M5 generates and advisory

OES Advisories Considered/Issued

- June 1985 San Diego County (Issued)
- July 1986 North Palm Springs (Not Issued)
- July 1986 Chalfant Valley (Issued)
- October 1987 Whittier Narrows (Not Issued)
- November 1987 Superstition Hills (Not Issued)
- June 1988 Gorman (Not Issued)
- June 1988 Lake Elsman (Issued)
- August 1989 Lexington Reservoir (Issued)
- October 1989 Loma Prieta
- April 1992 Humboldt (Not Issued)
- June 1992 Landers-Big Bear (Issued)
- November 2004 Bombay Beach Swarm (not Issued)
- October 2007 San Jose (Issued)
- March 2009 Bombay Beach (Issued)

Yucaipa Earthquake of June 16, 2005:

CEPEC was convened at the request of the Governor's Office of Emergency Services to consider if the June 16, 2005, M4.9 Yucaipa earthquake had increased significantly the chances for a larger event on the nearby San Andreas fault.

The standard aftershock probability report on the CISEN (California Integrated Seismic Network) website states "Most likely, the recent mainshock will be the largest in the sequence. However, there is a small chance (APPROXIMATELY 5 TO 10 PERCENT) of an earthquake equal to or larger than this mainshock in the next 7 days."

CEPEC felt this statement provided a sufficient statement of the probabilities as we understand them and decided not to provide additional comment beyond the aftershock probability statement already provided on the CISEN and the STEP websites.

2007 Alum Rock earthquake:

A magnitude 5.6 earthquake occurred at 8:05 this evening (30 October 2007). The earthquake occurred near the junction of the Calaveras and Hayward faults in the southern San Francisco Bay area. Both of these faults are known active faults, capable of producing large, damaging earthquakes.

CEPEC believes that this evening's earthquakes have significantly increased the probability above the normal level for a damaging earthquake along the Calaveras and/or Hayward faults within the next several days. However, the overall likelihood of such an event is still low. Scientists will be continuing to monitor the situation and advise OES of any changes. CEPEC recommends that residents in the San Francisco Bay area review their earthquake preparedness and family communication plans.

First Keilis-Borok Prediction

The Keilis-Borok methodology appears to be a legitimate approach in earthquake prediction research; however, there is no known physical basis for the prediction, nor is there a sufficiently long track record to statistically validate their forecast. Continued research in this area may lead to useful forecasts.

Although the analysis has matured to the point of generating provocative scientific results, the absence of an established track record and the sensitivity of the results to input assumptions leaves CEPEC uncertain of the robustness of the prediction made using patterns of small earthquakes. This uncertainty along with the large geographic area included in the prediction (about 12,400 sq. mi.) leads CEPEC to conclude that the results do not at this time warrant any special public policy actions in California.

Second: Keilis Borok Prediction

The Keilis-Borok method is based on identifying patterns of small earthquakes prior to large shocks. To date there is no evidence that these, or related methods, yield useful intermediate term forecasts. Furthermore, the Council has heard no valid physical basis for the Keilis Borok methodology. Given the track record so far and the lack of a physical basis, the Council does not consider the method to be a basis for public policy. Therefore, CEPEC advises OES to take no special public policy actions based on this, or similar predictions.

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